The Digital Reference

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The year is 2015. You are the battle captain in charge of current operations — a key member of the redesigned task force staff. The battalion commander's face suddenly appears on your teleconference screen. He sends satellite imagery of the enemy positions to your whiteboard terminal along with instructions to prepare an electronic OPORD in an hour. The screen goes black. Around you, the crew of your Staff Operations Vehicle has already begun to assemble data. The Friendly Ops officer has logged on to the TOTAL RECALL site and has begun providing information to the intelligent search agent. Within seconds you will have files from the Center for Army Lessons Learned showing what other units have done in similar situations, the results of their actions, and the lessons they learned. This information will prove critical in your effort to prepare an OPORD so rapidly. But is this scenario nothing but science fiction? Last June, the Mounted Maneuver Battle Lab (MMBL) conducted Battle Command Reengineering II (BCR 2) and examined just such a scenario. BCR is an on-going experimental program examining advanced digitization's effects on battle command at brigade and below. Among other subjects, MMBL examined an on-line manual — a precursor to TOTAL REI-CALL (Retrieve Information [REI] from Center for Army Lessons Learned [CALL]) the interactive system described in the above scenario. The on-line manual is another step in the MMBL and CALL cooperative effort to develop for the Army After Next (AAN) an on-line information retrieval tool to aid in situation analysis and decision-making during training and operations.

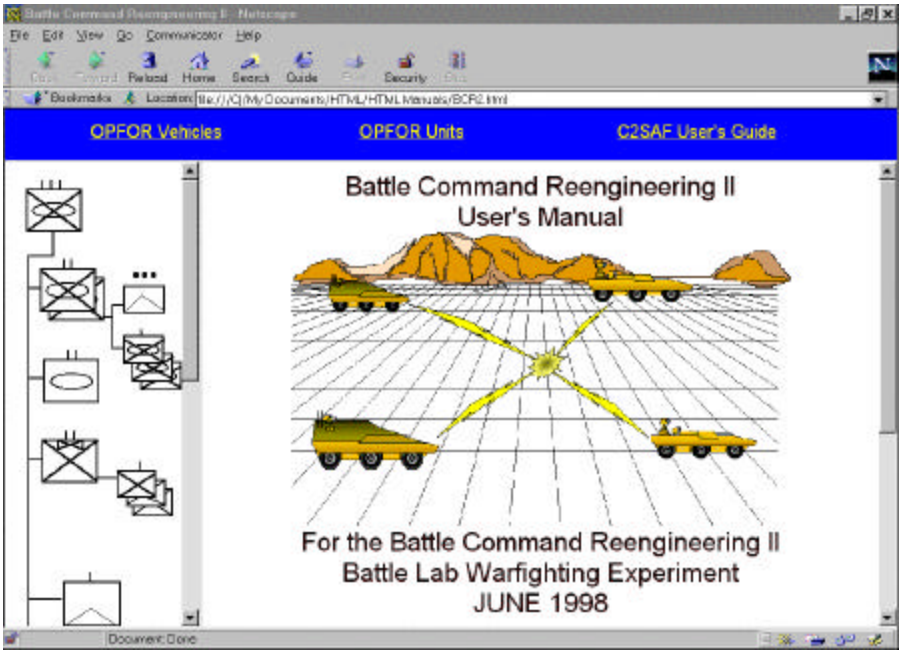
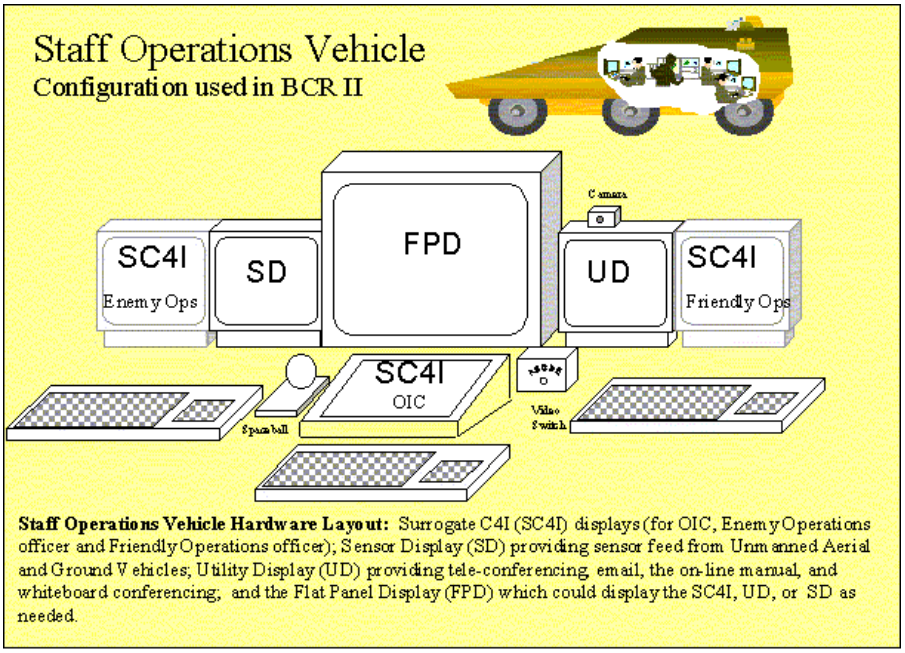


Figure 1. BCR on-line manual start page.



Staff Operations Vehicle Hardware Layout: Surrogate C4I (SC4I) displays (for OIC, Enemy Operations officer and Friendly Operations officer); Sensor Display (SD) providing sensor feed from Unmanned Aerial and Ground Vehicles; Utility Display (UD) providing tele-conferencing, email, the on-line manual, and whiteboard conferencing; and the Flat Panel Display (FPD) which could display the SC4I, UD, or SD as needed.

The on-line manual used in BCR 2 combines text and graphics into an intuitive web-based user interface to provide soldiers quick reference to information. Because the manual was written in hypertext markup language (HTML), it behaves similarly to a web page and is viewed in a web browser. The manual combines three separate sections: a hardware/software user's guide, an OPFOR order of battle, and an OPFOR vehicle/equipment reference. The site is organized using HTML frames. The top frame provides top level navigation between the three sections. The left frame shows the table of contents for the currently selected section. This table is provided in a combination of text and graphics to help the user quickly locate a subject. The largest frame provides the selected content. This layout allows the user to immediately move to another section or any location with just a click of the mouse.

Future improvements to the manual include linking the manual's subject matter to real-world examples that illustrate techniques and lessons learned, and to related material in the CALL database. For example, we can show how to maximize the BCR custom hardware and software's utility in planning and conducting operations. Links can also provide a user with AAR-style replay of previous BCR missions so that the user can examine the effects of different tactics, techniques, and procedures in relation to the future vehicles and technologies provided in BCR. A user interested in planning an Unmanned Aerial Vehicle (UAV) reconnaissance route could select from a list of clips showing previous UAV recon missions. A user interested in properly placing Unmanned Ground Vehicles (UGV) on a screen line to ensure sensor coverage in depth could select from a list of clips showing scout platoon screen line missions. Finally, a user faced with planning a complex deliberate breach could search the CALL database for similar missions. The use and continued development of the on-line manual will provide insights to guide the development of TOTAL REI-CALL.

The goal of the TOTAL REI-CALL program is to provide commanders and staff an on-line tactical information retrieval tool. The software will include an intelligent search agent, which prompts the user for all relevant information about the tactical scenario and then searches the database. The search agent will have the ability to identify parallels between the current tactical scenario and the scenarios of missions stored in the database. The search agent will provide the user with relevant missions and lessons learned. Additional software will allow the user to adapt the information and lessons from past missions into the current situation allowing virtual wargaming and rapid course of action development and analysis. The result will be that lessons learned from past experience can be injected into the planning cycle, thus improving planning efficiency and effectiveness.

TOTAL REI-CALL is one of a number of digital on-line tools being examined by the Armor Center. Digital references such as tactical and gunnery field manuals (FMs) and technical manuals (TMs) may become reality in the Army After Next. Virtual FM is an MMBL/Directorate of Training and Doctrine Development combined initiative to convert text-based field manuals to on-line 3D visualization. Another tool is the Digital Technical Manual, which could be combined with on-board vehicle sensors to automatically detect and diagnose mechanical faults. After detecting a fault, the digital TM could direct operators and mechanics to the relevant section of the database, providing procedures and parts information needed to correct the fault. As digital references mature, they may be integrated into one database combining TOTAL REI-CALL, Digital FMs, and Digital TMs. This database could be tailored to the user's needs at each level, vehicle, platoon, company, etc. The result would be a wealth of information available immediately which would help the soldier and leader maximize performance.

TOTAL REI-CALL involves a series of requirements and emerging technologies to meet those requirements. Data must be collected and indexed in CALL's database. Intelligent search agents and virtual modeling software must be designed. And the information must be on line and readily accessible. Several technologies will support TOTAL REI-CALL. The Training Feedback Module-Training Center Version (TFM-TC), a Windows-based/user-friendly software package, was recently implemented at the National Training Center. The TFM-TC captures mission conditions and relates them to task performance/task standards. It also provides information on how units have dealt with previously encountered situations. The TFM-TC further provides an automated means of executive summary report production, AAR preparation/presentation, and take-home package production. Once data has been captured, the MMBL will experiment to develop optimal methods for presenting the data to the user. As these technologies mature and are put into use, TOTAL REI-CALL will move towards implementation and the futuristic scenarios examined in BCR may become more reality than science fiction.

For more information on Battle Command Reengineering or other ongoing experimentation at the MMBL, visit their web site at:

http://knox-www.army.mil/mbbl